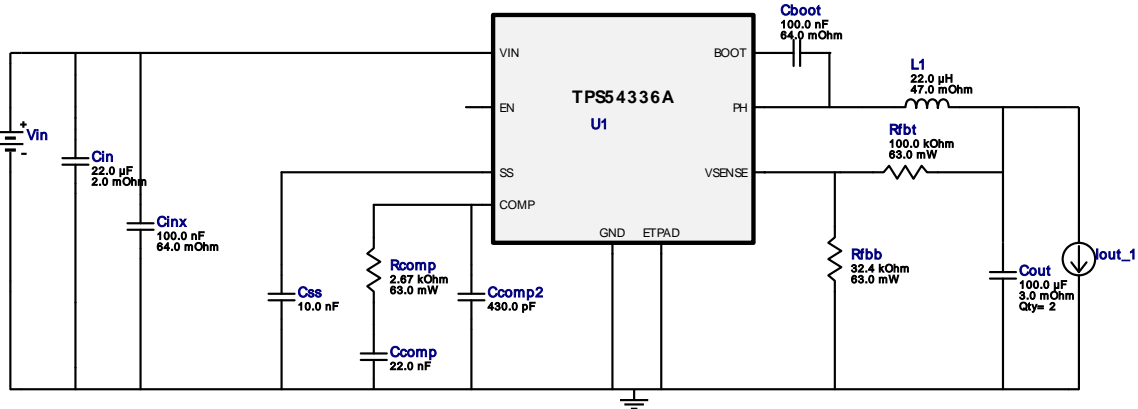


**WEBENCH<sup>®</sup> Design Report**

 Design : 4397866/1 TPS54336ADDAR  
 TPS54336ADDAR 14.0V-22.0V to 3.30V @ 2.0A

 VinMin = 14.0V  
 VinMax = 22.0V

 Vout = 3.3V  
 Iout = 2.0A

**Electrical BOM**

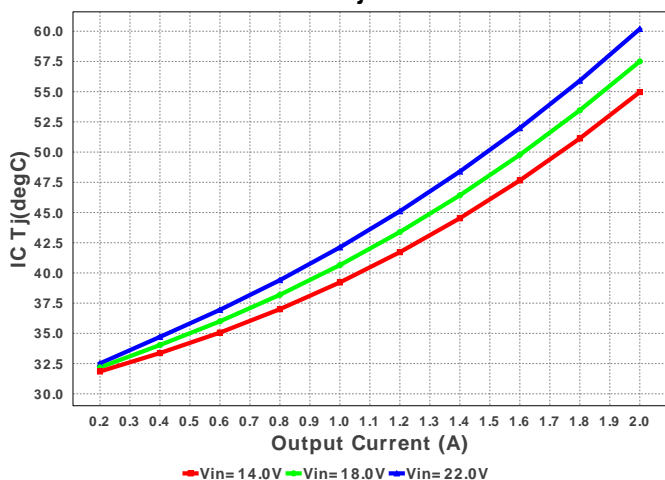
#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
1.	Cboot	Kemet	C0805C104K5RACTU Series= X7R	Cap= 100.0 nF ESR= 64.0 mOhm VDC= 50.0 V IRMS= 1.64 A	1	\$0.01	 0805 7 mm <sup>2</sup>
2.	Ccomp	Yageo America	CC0805KRX7R9BB223 Series= X7R	Cap= 22.0 nF VDC= 50.0 V IRMS= 0.0 A	1	\$0.01	 0805 7 mm <sup>2</sup>
3.	Ccomp2	Samsung Electro-Mechanics	CL21C431JBANNNC Series= C0G/NP0	Cap= 430.0 pF VDC= 50.0 V IRMS= 0.0 A	1	\$0.01	 0805 7 mm <sup>2</sup>
4.	Cin	MuRata	GRM32ER61E226KE15L Series= X5R	Cap= 22.0 uF ESR= 2.0 mOhm VDC= 25.0 V IRMS= 3.67 A	1	\$0.16	 1210 15 mm <sup>2</sup>
5.	Cinx	Kemet	C0805C104K5RACTU Series= X7R	Cap= 100.0 nF ESR= 64.0 mOhm VDC= 50.0 V IRMS= 1.64 A	1	\$0.01	 0805 7 mm <sup>2</sup>
6.	Cout	MuRata	GRM31CR60J107ME39L Series= X5R	Cap= 100.0 uF ESR= 3.0 mOhm VDC= 6.3 V IRMS= 0.0 A	2	\$0.20	 1206 11 mm <sup>2</sup>
7.	Css	MuRata	GRM033R61A103KA01D Series= X5R	Cap= 10.0 nF VDC= 10.0 V IRMS= 0.0 A	1	\$0.01	 0201 2 mm <sup>2</sup>
8.	L1	Bourns	SDR1307-220ML	L= 22.0 uH DCR= 47.0 mOhm	1	\$0.35	 SDR1307 227 mm <sup>2</sup>
9.	Rcomp	Vishay-Dale	CRCW04022K67FKED Series= CRCW..e3	Res= 2.67 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	 0402 3 mm <sup>2</sup>

#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
10.	Rfbb	Vishay-Dale	CRCW040232K4FKED Series= CRCW..e3	Res= 32.4 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	0402 3 mm <sup>2</sup>
11.	Rfbt	Vishay-Dale	CRCW0402100KFKED Series= CRCW..e3	Res= 100.0 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	0402 3 mm <sup>2</sup>
12.	U1	Texas Instruments	TPS54336ADDAR	Switcher	1	\$0.90	

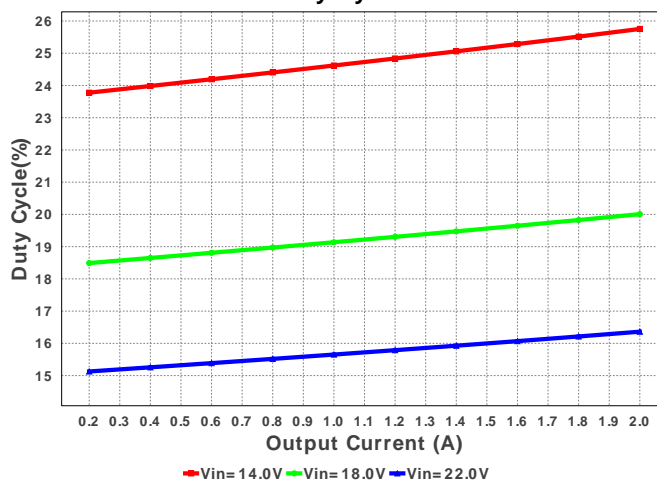


R-PDSO-G8 57 mm<sup>2</sup>

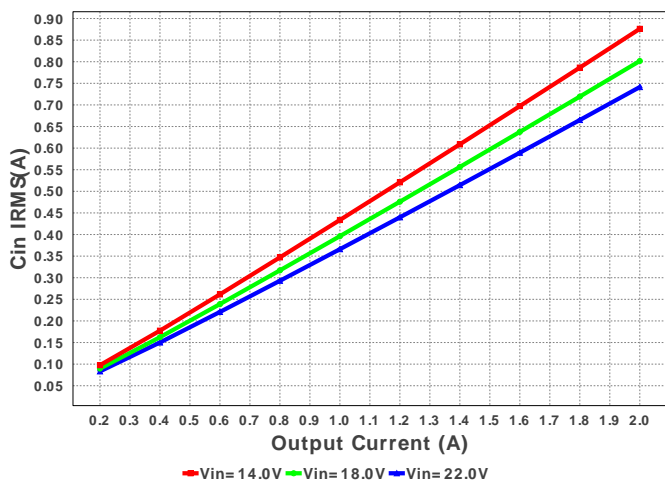
IC Tj



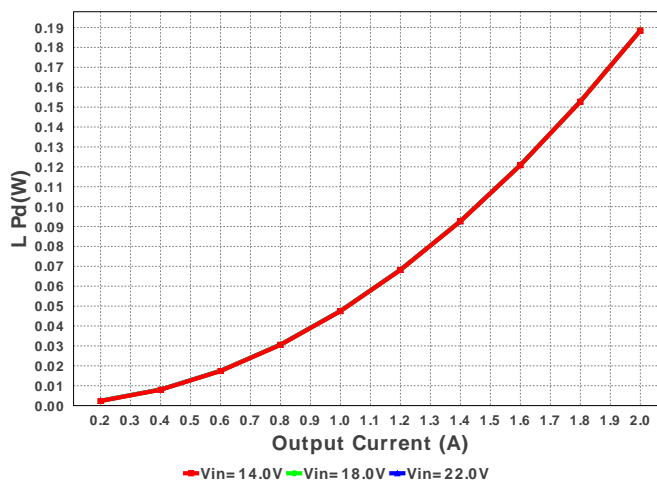
Duty Cycle

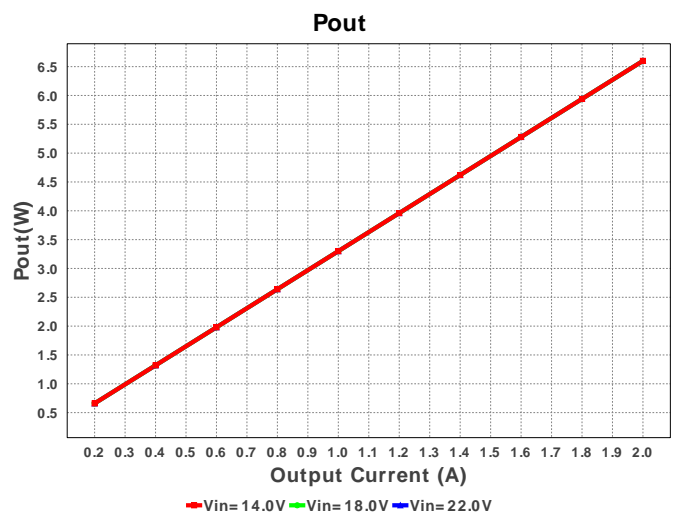
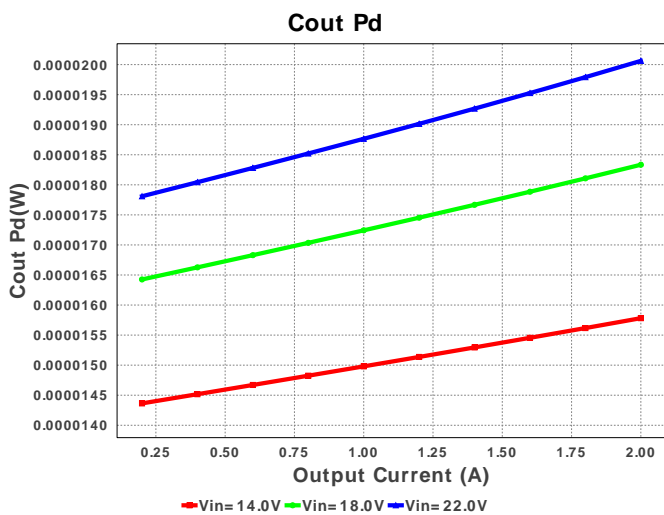
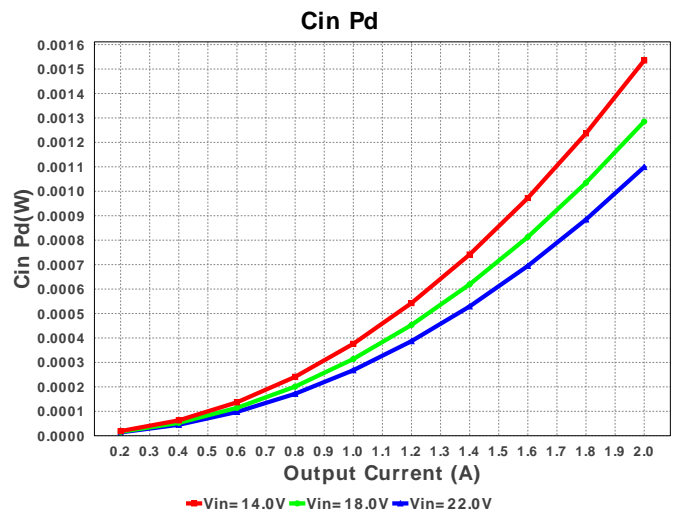
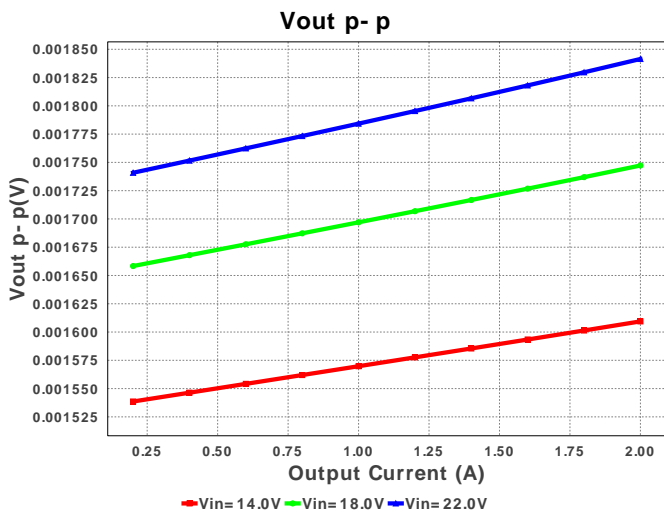
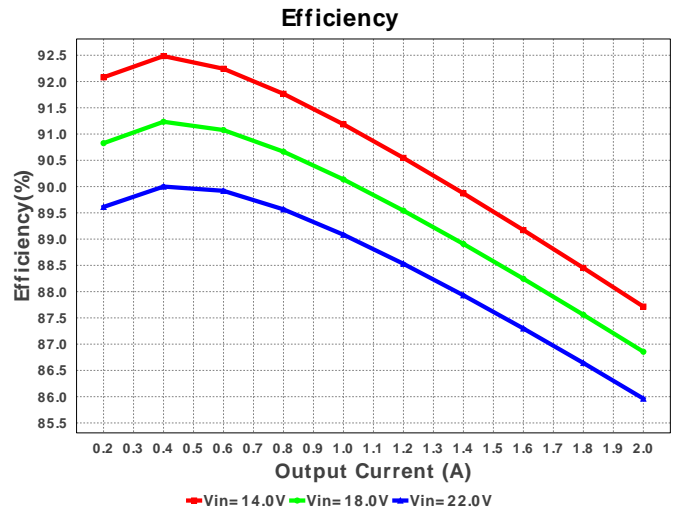
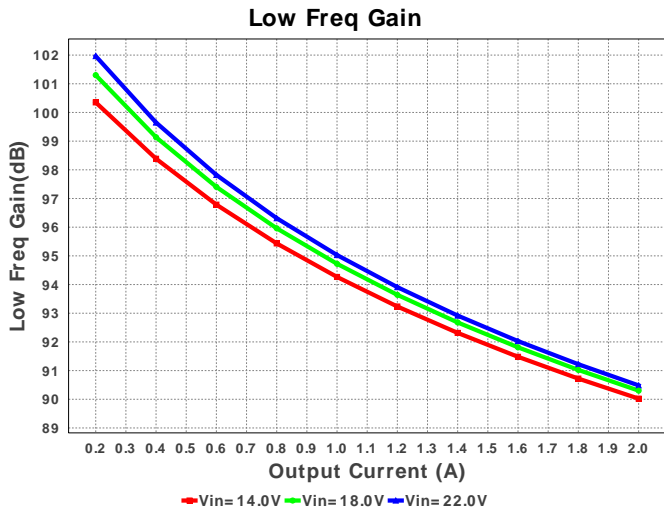


Cin IRMS

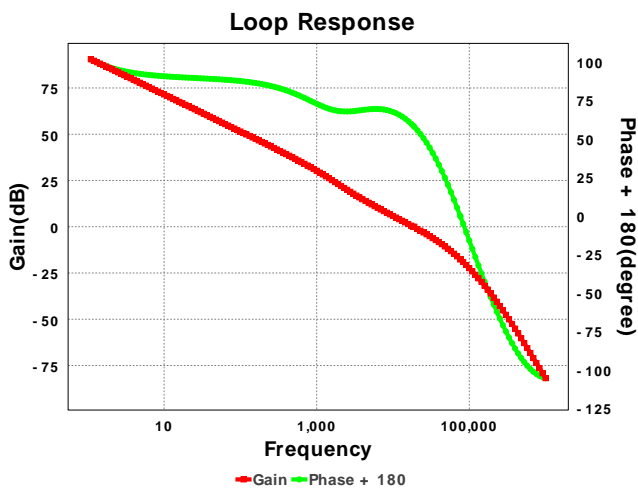
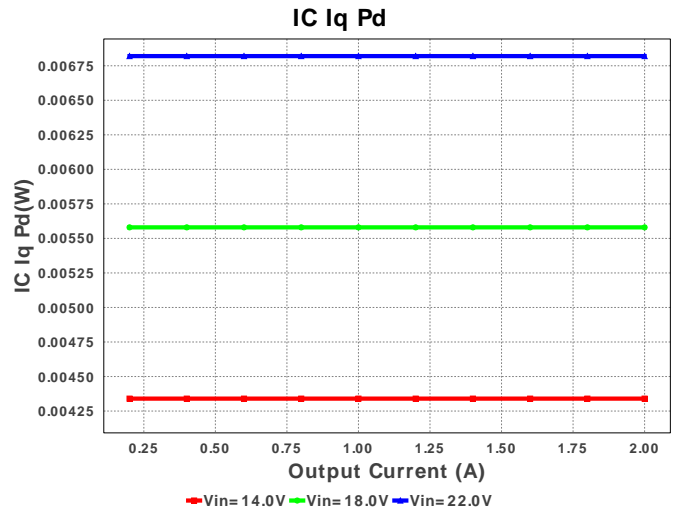
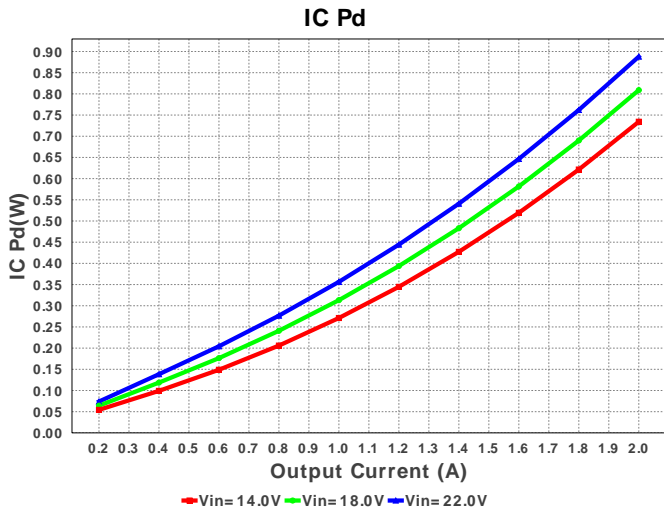


L Pd









### Operating Values

#	Name	Value	Category	Description
1.	Cin IRMS	741.333 mA	Current	Input capacitor RMS ripple current
2.	Cout IRMS	115.649 mA	Current	Output capacitor RMS ripple current
3.	Iin Avg	348.99 mA	Current	Average input current
4.	L Ipp	400.62 mA	Current	Peak-to-peak inductor ripple current
5.	BOM Count	13	General	Total Design BOM count
6.	FootPrint	359.0 mm <sup>2</sup>	General	Total Foot Print Area of BOM components
7.	Frequency	340.0 kHz	General	Switching frequency
8.	IC Tolerance	10.0 mV	General	IC Feedback Tolerance
9.	Pout	6.6 W	General	Total output power
10.	Total BOM	\$1.89	General	Total BOM Cost
11.	ICThetaJA Effective	34.0 degC/W	Op_Point	Effective IC Junction-to-Ambient Thermal Resistance
12.	Vout OP	3.3 V	Op_Point	Operational Output Voltage
13.	Cross Freq	18.473 kHz	Op_point	Bode plot crossover frequency
14.	Duty Cycle	16.362 %	Op_point	Duty cycle
15.	Efficiency	85.963 %	Op_point	Steady state efficiency
16.	Gain Marg	-17.686 dB	Op_point	Bode Plot Gain Margin
17.	IC Tj	60.188 degC	Op_point	IC junction temperature
18.	IOUT_OP	2.0 A	Op_point	Iout operating point
19.	Phase Marg	58.97 deg	Op_point	Bode Plot Phase Margin
20.	VIN_OP	22.0 V	Op_point	Vin operating point
21.	Vout p-p	1.841 mV	Op_point	Peak-to-peak output ripple voltage
22.	Cin Pd	1.099 mW	Power	Input capacitor power dissipation
23.	Cout Pd	20.062 μW	Power	Output capacitor power dissipation
24.	IC Iq Pd	6.82 mW	Power	IC Iq Pd
25.	IC Pd	887.878 mW	Power	IC power dissipation
26.	L Pd	188.629 mW	Power	Inductor power dissipation
27.	Total Pd	1.078 W	Power	Total Power Dissipation
28.	Low Freq Gain	90.483 dB	Unknown	Gain at 10Hz

### Design Inputs

#	Name	Value	Description
1.	Iout	2.0	Maximum Output Current
2.	Iout1	2.0	Output Current #1
3.	VinMax	22.0	Maximum input voltage
4.	VinMin	14.0	Minimum input voltage
5.	Vout	3.3	Output Voltage
6.	Vout1	3.3	Output Voltage #1
7.	base_pn	TPS54336A	Base Product Number
8.	source	DC	Input Source Type
9.	Ta	30.0	Ambient temperature

## Design Assistance

1. **TPS54336A** Product Folder : <http://www.ti.com/product/TPS54336A> : contains the data sheet and other resources.

Texas Instruments' WEBENCH simulation tools attempt to recreate the performance of a substantially equivalent physical implementation of the design. Simulations are created using Texas Instruments' published specifications as well as the published specifications of other device manufacturers. While Texas Instruments does update this information periodically, this information may not be current at the time the simulation is built. Texas Instruments does not warrant the accuracy or completeness of the specifications or any information contained therein. Texas Instruments does not warrant that any designs or recommended parts will meet the specifications you entered, will be suitable for your application or fit for any particular purpose, or will operate as shown in the simulation in a physical implementation. Texas Instruments does not warrant that the designs are production worthy.

**You should completely validate and test your design implementation to confirm the system functionality for your application prior to production.**

Use of Texas Instruments' WEBENCH simulation tools is subject to [Texas Instruments' Site Terms and Conditions of Use](#). Prototype boards based on WEBENCH created designs are provided AS IS without warranty of any kind for evaluation and testing purposes and are subject to the terms of the [Evaluation License Agreement](#).